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Global Security Overview

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Program Director,
Nuclear Nonproliferation & Security

11 January 2019



Managed by Triad National Security, LLC for the U.S. Department of Energy's NNSA

One Laboratory, One Mission: Strategic Deterrence

Detecting and Preventing the development or use of nuclear weapons and improvised devices.

NUCLEAR COUNTERPROLIFERATION

NUCLEAR NONPROLIFERATION

Reducing and Limiting nuclear arms and the spread of nuclear materials, technology, and expertise through cooperation and diplomacy.



STOCKPILE STEWARDSHIP

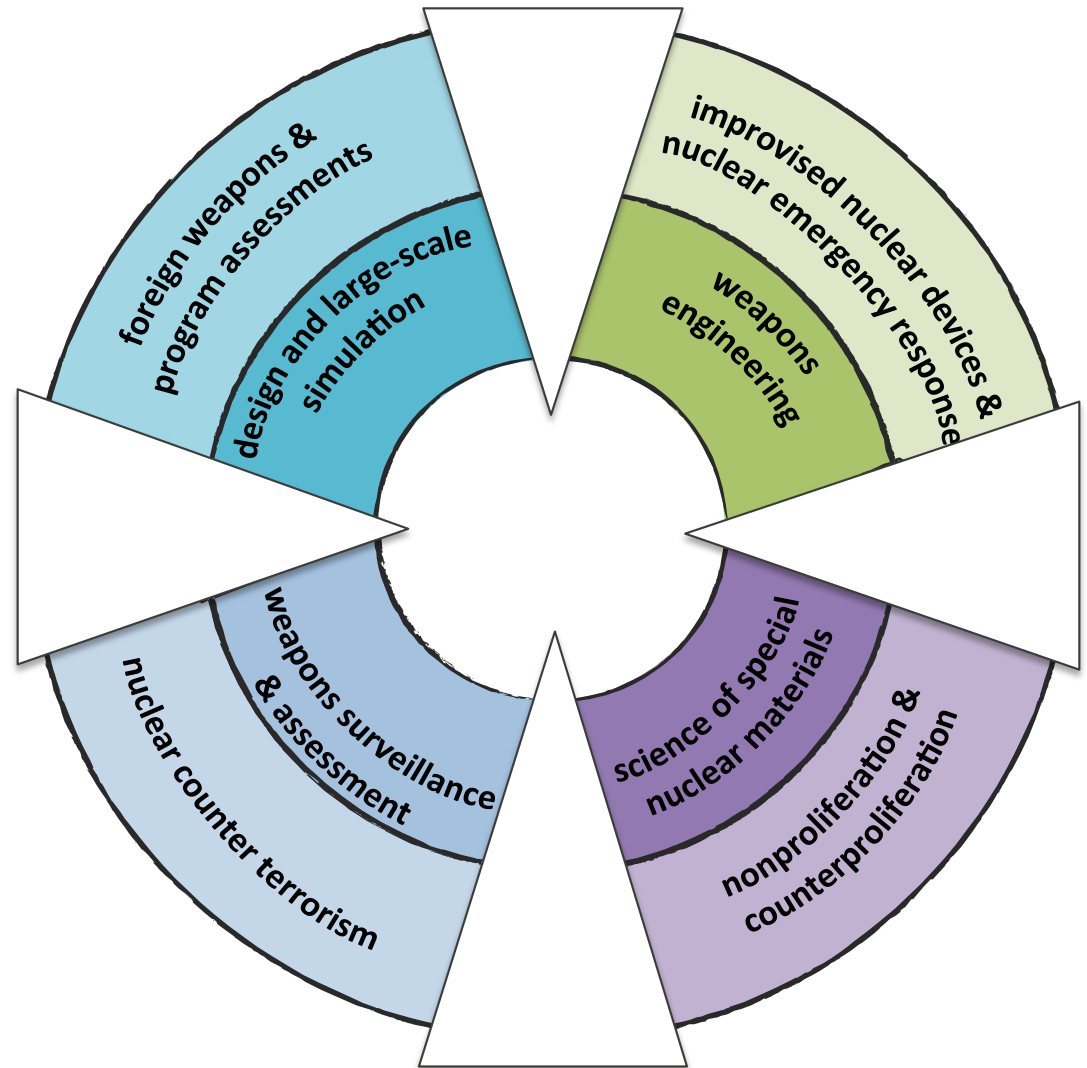
Assuring our nation's defense with a strategic nuclear deterrence through theory, modeling and simulation, and experimentation.

Los Alamos National Laboratory

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The Weapons Program and Global Security Programs develop strength through synergy, as GS develops new applications for Weapons expertise



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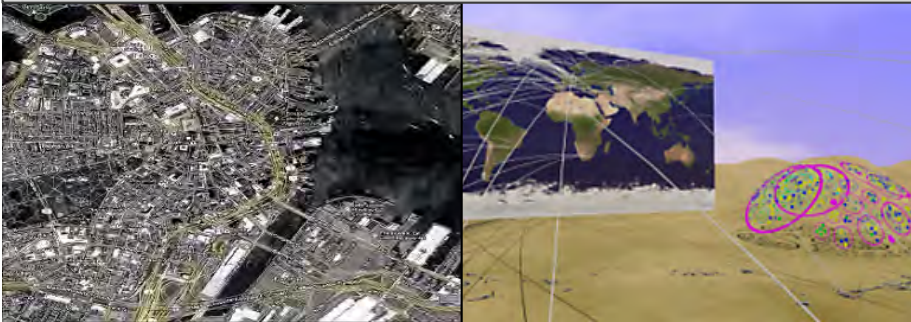


Chief Operating Officer

Evelyn Mullen

Our Global Security organization has three technical divisions

Analytics, Intelligence, & Technology



Intelligence & Space Research



Nuclear Engineering & Nonproliferation



Divisions: Analytics, Intelligence, and Technology



We merge all-source intelligence on national security threats with cross-domain systems modeling, information synthesis, and communications tools to enable technology development and application in the national interest.



Divisions: Intelligence and Space Research

We create, deliver, support and exploit innovative sensing systems for space-based, airborne, and ground-based applications to address critical national security and scientific challenges.



Divisions: Nuclear Engineering and Nonproliferation

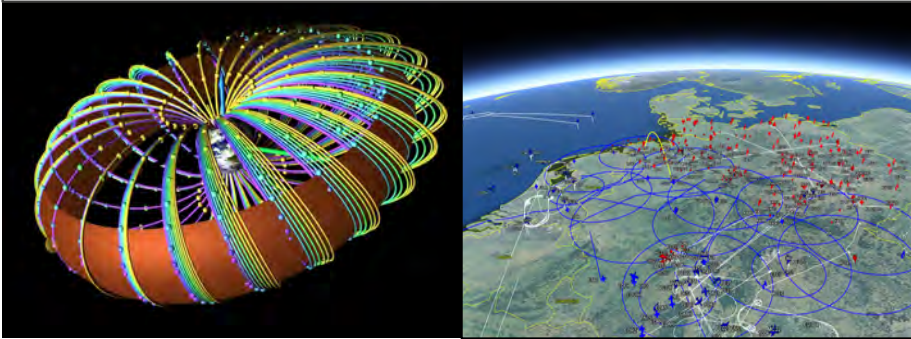
Core capabilities:

- ▶ Nuclear engineering
- ▶ Criticality safety research & experiments
- ▶ Nondestructive assay
- ▶ Reactor design & analysis
- ▶ Radiation detection/identification
- ▶ Radiation transport modeling
- ▶ Full life-cycle detector R&D

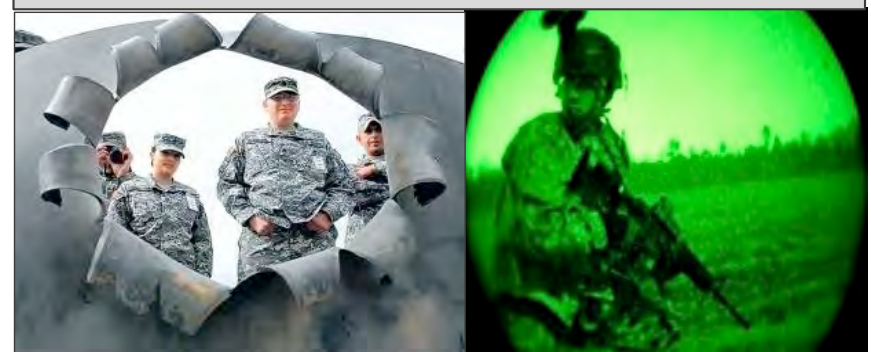


Our Global Security organization has four program offices

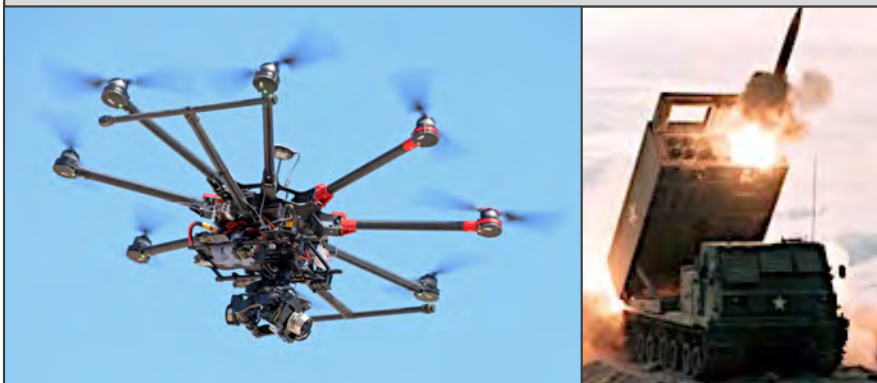
Intelligence & Emerging Threats



Nuclear Counterterrorism & Counter Proliferation



National Security & Defense



Nuclear Nonproliferation & Security

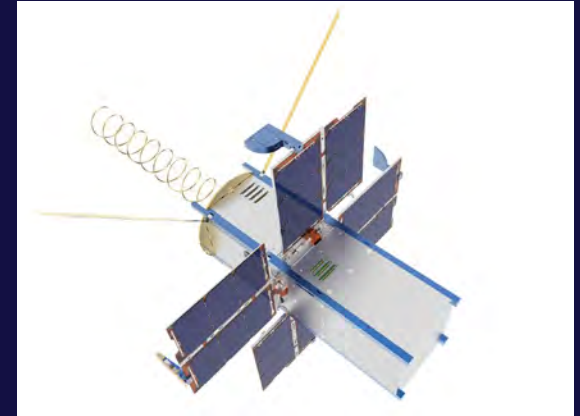


Programs: Nuclear Security & Defense

- ▶ Asymmetric Threats
- ▶ Warfighter encounters with WMD
- ▶ Space Defense

Customer Focus

- ▷ Department of Homeland Security
- ▷ Department of Defense



Programs: Intelligence and Emerging Threats

- ▶ Counter new foreign technologies
- ▶ Predict or prevent catastrophic threats
- ▶ Improve technical security & surveillance measures

Customer Focus

- ▷ Intelligence Community
- ▷ Department of Homeland Security



Programs: Nuclear Counterterrorism & Counterproliferation

- ▶ Nuclear Incident Response
- ▶ Foreign Nuclear Threat Reduction
- ▶ Nuclear Forensics

Customer Focus

- ▷ DOE/NNSA NA-80
- ▷ Defense Threat Reduction Agency
- ▷ Department of Defense
- ▷ Federal Bureau of Investigation



Programs: Nuclear Nonproliferation & Security

- ▶ Detect and deter nuclear smuggling, proliferation, and detonations
- ▶ Secure and recover radiological material
- ▶ Strengthen nuclear arms control and treaty verification with international partners
- ▶ Train IAEA inspectors

Customer Focus

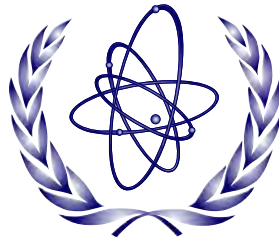
- ▷ NNSA/NA-20
- ▷ State Department
- ▷ NASA



The GS-NNS Program Office focuses on preventing nuclear proliferation and enhancing nuclear security



Los Alamos trains and supports the IAEA



Los Alamos has pioneered a wide range of IAEA measurement tools in use today and continues to innovate with new technology



Every new IAEA inspector since 1980 has come to Los Alamos for training



SCIENCE

How Do You Find Plutonium? Go To Nuclear Inspector School

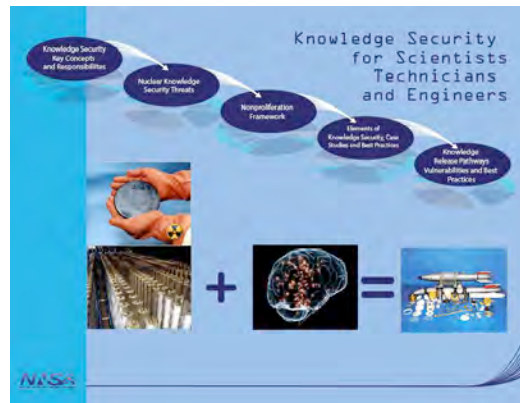
October 19, 2015 · 4:25 AM ET
Heard on Morning Edition



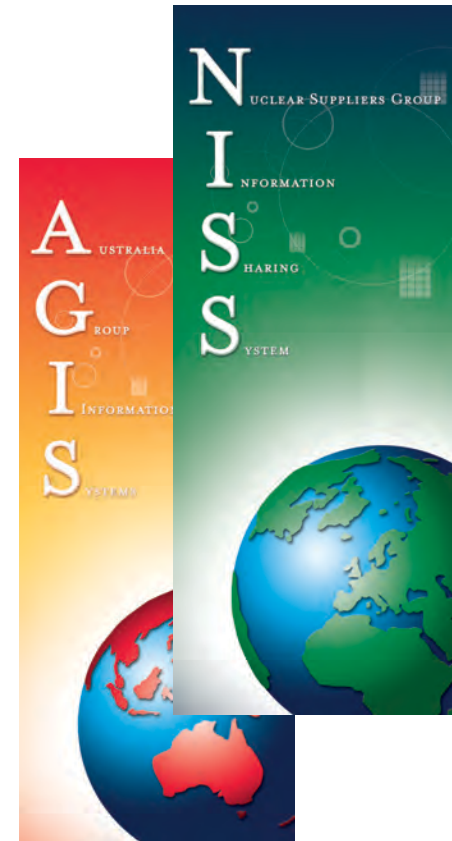
59th NDA Inspector Training Course, 2016



Los Alamos works globally to improve nuclear security



We engage with international partners to build technical capabilities through training programs and workshops.



We work to limit the spread of sensitive materials and technologies through strategic trade controls.

Off-site Source Recovery Program secures vulnerable materials



Since 1997



37,000

Radioactive sealed sources have been removed



containing more than
1 million
curies



from over
1,300

industrial, educational,
healthcare, and
governmental facilities
worldwide

OSRP BY THE NUMBERS

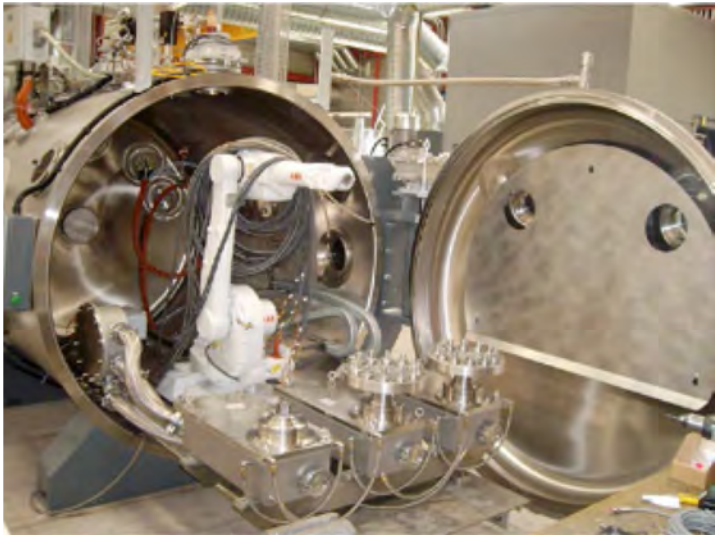
We support efforts to detect and deter nuclear smuggling

We provide support for radiation detection systems at borders, as well as test and evaluate new detection technologies



Los Alamos works to reduce global HEU and Pu inventories

Conversion of research reactors from HEU to LEU



Joint Japan-U.S. experiments at NCERC in support of return of fuel from Japanese Fast Critical Assembly

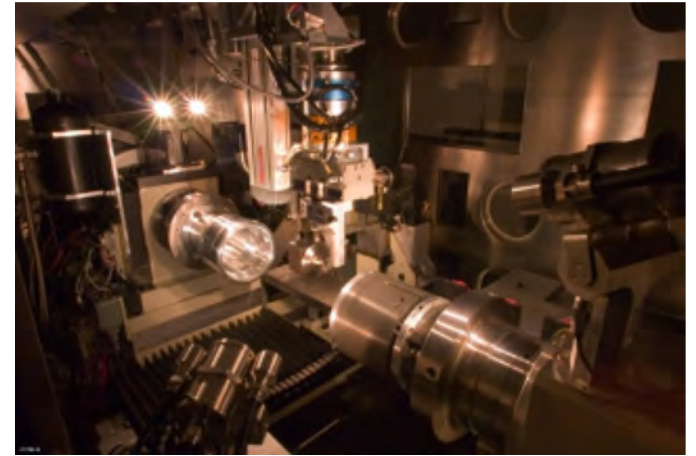
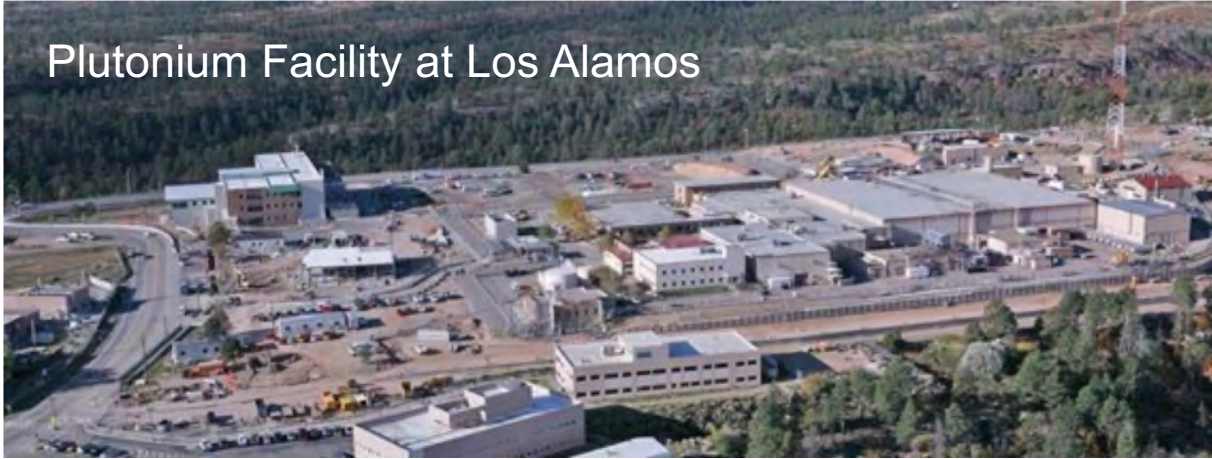


Mo-99 production without HEU

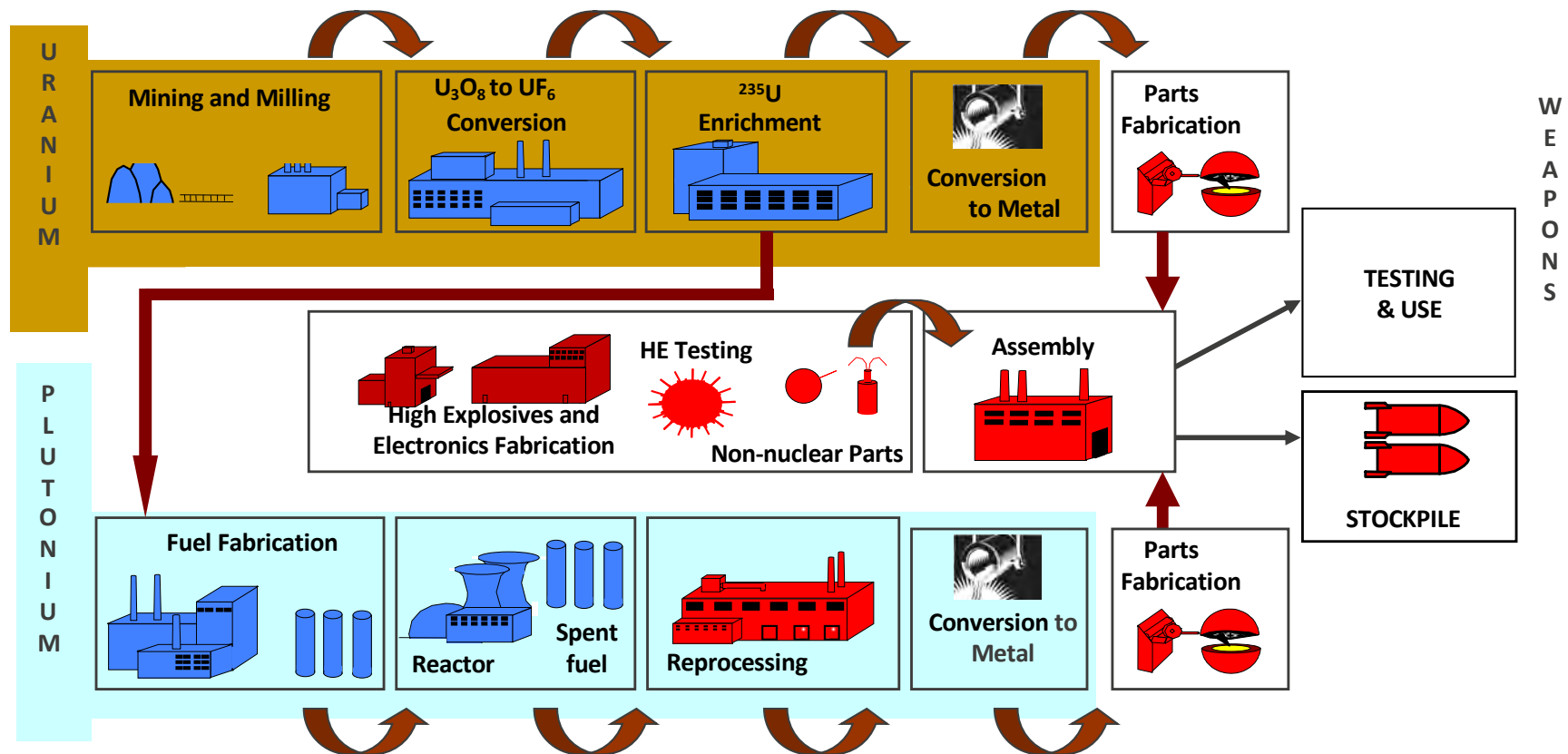


ARIES supports disassembly of Pu components & their conversion to oxide for use in MOX fuel or dilution & disposal

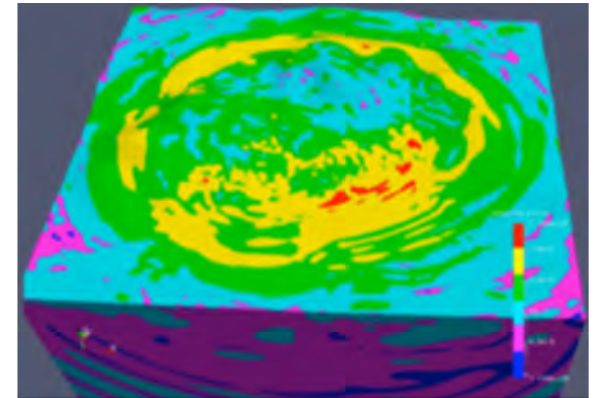
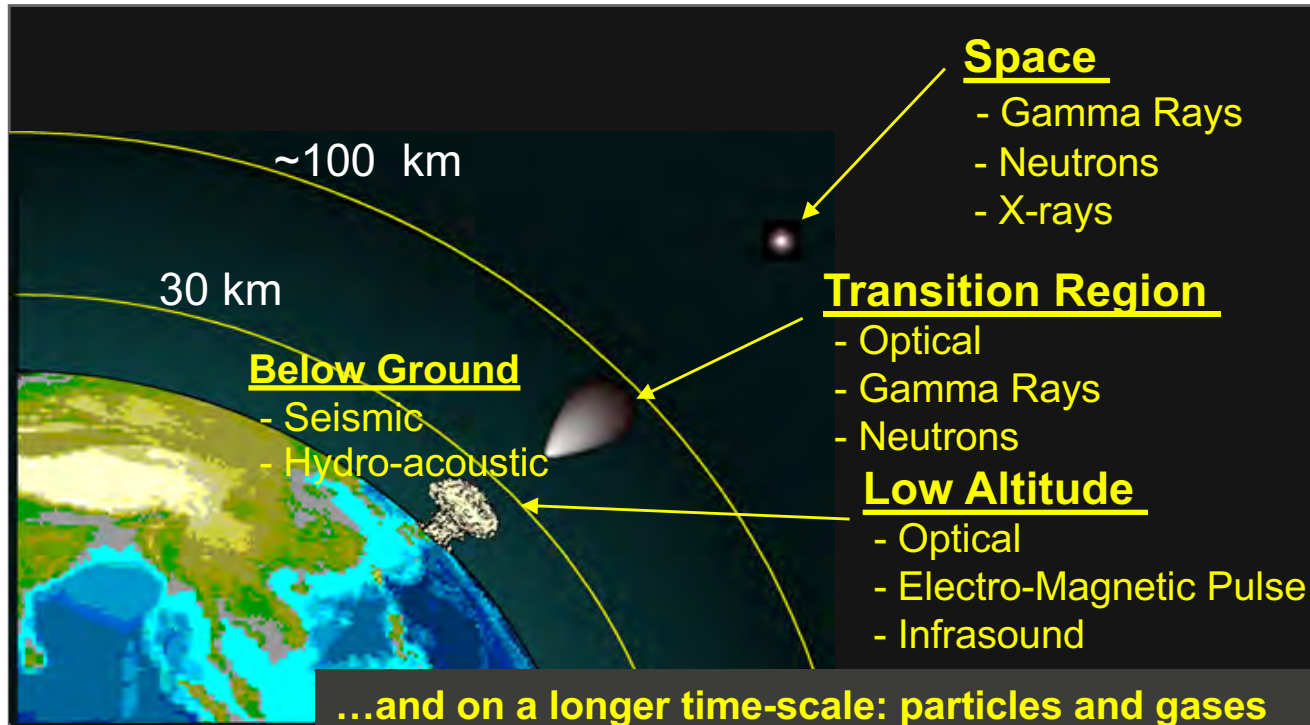
Plutonium Facility at Los Alamos



We develop new capabilities to detect, characterize, and monitor Special Nuclear Material production and weaponization activities



Los Alamos develops and applies science and technology to benefit nuclear detonation detection missions



Seismic propagation simulations

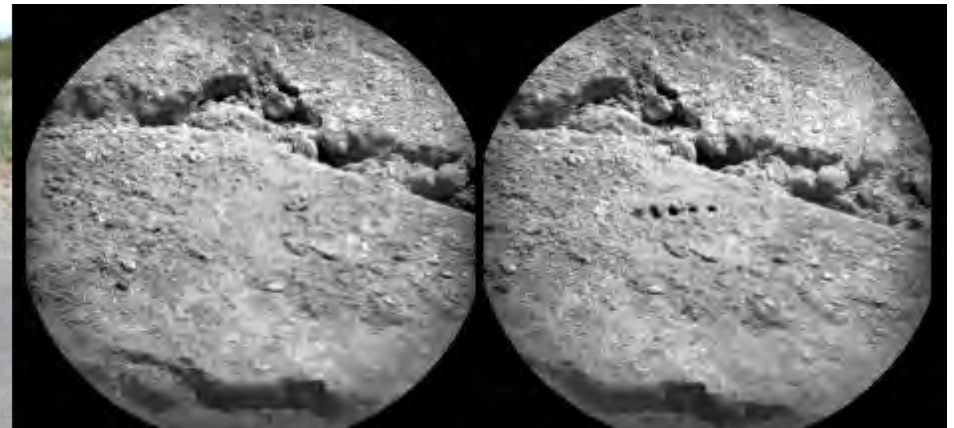


Source Physics Experiment



*Space and
Atmospheric Burst
Reporting System
(SABRS) Flight Unit
2 payload*

Los Alamos laser for detecting nuclear material on Earth goes to Mars to determine habitability



- ▷ Laser-Induced Breakdown Spectroscopy (LIBS) was a Laboratory-Directed Research and Development (LDRD) project to look for material within gloveboxes at LANL's plutonium facility.
- ▷ A backpack LIBS unit has been developed for consideration by the IAEA.
- ▷ LIBS is the basis for the ChemCam laser unit on the current Mars Curiosity rover; the next-generation SuperCam instrument has been selected for the Mars 2020 mission, which endeavors to pave the way for human visitation to the Red Planet.

Questions?

